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METHODS OF PRODUCTION AND DISTRIBUTION OF MILK.

BEING AN ADDRESS DELIVERED AT
THE BRISTOL SHOW OF THE BATH
AND WEST AND SOUTHERN COUNTIES
SOCIETY, ON SATURDAY, JUNE 4TH, 1921.

BY

DR. R. STENHOUSE WILLIAMS.

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METHODS OF PRODUCTION AND DISTRIBUTION OF MILK.

By DR. R. STENHOUSE WILLIAMS.

THE NEED FOR MORE COMBINATION IN THE MILK TRADE.

IN the "Times" of Thursday, May 5th, 1921, may be found a statement that a working basis has been reached between the directors of the Railway Companies and the members of their Staffs. On Friday, May 6th, there were indications that peace in Ireland may be attained and a way out of the coal strike be found.

These, to any sane person, must be portents of joy since they indicate the right kind of termination to the long years of strain and anxiety, but of much pride to our country, through which we have all been passing.

It is not possible to watch with anxious eyes the recent happenings in our country without enquiring the causes that have led to so much turmoil. It is not enough to blame the war, though that may have precipitated events, for already the stir was in the air before the war began. One answer at least appears to be readily available. It is found in the words of the miners, who claim that whatever their wages may be they shall be such as to enable them to maintain a certain standard of living; with which the maintenance of a social standard is more intimately connected than many imagine.

This, the old claim of the right to live decently which has been growing in strength for many years, was bound to follow any system of general education and is entirely just, if it be associated with the recognition of the dignity and duty of work. The two must go hand-in-hand if they are to be effective and there can be no limitation of the hours of work of a free man. This paper is begun on a Saturday night, most of it will, I hope, be written on Sunday, because at those times I am more or less free from multifarious other duties. If anyone came to me and said, "thou shalt work from ten to four," I should reply, "get thee along my child and do not bother me, I am busy." Any free man ought to be in the same position, why is he not? Probably one answer may be found in the fact that in the past the workers have thought that the employer did not pay them their fair share of the profits and by way of reprisal they have endeavoured to limit output and thus extract an increased share of the monetary gain.

A far better method has been found on the railways since the workers now have a knowledge of the exact financial position and are paid accordingly. Here at last is a proper method of procedure, a wage based on the economic results of the industry with complete knowledge of all the facts before all those concerned, a combination of interests which must lead to greater efficiency and contentment.

What has been effected on the railways appears likely to be effected in the mines. It is most urgently needed in the whole milk industry.

At the present time the old, old struggle concerning the price of milk between producers, wholesalers and retailers is being carried on. It is a constant sore in the industry and by its fretting insistence materially retards all progress.

The lack of community of interest makes each section which handles milk blame the other for all failures, when, as a fact, the failure should generally be shared between a variety of different people; for though the farmer's methods at the farm may often lack efficiency, the dirty churn which is returned to him by the dealer, and the improper handling of his milk on the railway, frequently renders his best efforts fruitless. If there were community of interest the resulting losses would be divided between all those who were responsible and a common effort for improvement would be made. Somehow that community of interest must be attained.

At the present time the National Farmers' Union is setting up local milk committees to fight prices. This procedure, if successful, has the advantage that the dairy farmer will have a little more money in his pocket. Such a man is more likely to be anxious to improve the work upon which he is engaged than one who fails to see a profit. It does not, however, create that community of interest which is so much needed. May one venture to suggest that the National Farmers' Union enlarge its vision and consider whether the basis of a more effective method might not be found hidden in Scheme P of the Milk Producers' Association, a scheme which proposed to pay the farmer for his milk according to quality, but was fatally weak in suggesting that the government should buy out the wholesaler for the benefit of the producer; or, in the recent scheme put forward which gave producers a share in a wholesaling company but was again considered evil because it insisted that the present shareholders in the wholesaling business should receive a fixed interest guaranteed in perpetuo.

I am tied to no scheme, I mention these because they are recent events. The one thing of which I am quite certain is that a greater community of interest between all those concerned in the milk and dairy industries would lead to great efficiency and that is all that matters to me.

When that day comes,—and indeed it has already begun in a small way in our own district, since the National Institute for Research in Dairying is already assisting wholesalers and producers who are handling the same milk to study their results together and to see where faults lie—when that day comes the demand for efficiency will go forward in leaps and bounds and the need for such work as we can do will be more urgently felt. It is good to think of the many ways in which we can help, for there is not only the efficiency of handling and distribution but also the efficiency of production, the necessity for which many hardly realise as yet.

Let me put before you some of the things which are being or require to be done.

THE BREEDING OF DAIRY HERDS.

On April 13th, 1921, my colleague, J. Mackintosh, published a paper in " Farm and Home " in which he pointed out the need for keeping bulls long enough to know the milking records of their progeny. He gave two illustrations, the one of a bull of which the progeny gave poor milking records ; the other of a bull, the progeny of which gave good milking records, and he told us that in both cases the bulls had been killed before their relative values for breeding purposes had been established. Mackintosh pointed out the error of this procedure and suggested that " the use of aged bulls of proved merit will decrease the uncertainty in breeding for milk."

His statement is true and its importance undoubted, but he knows that even if this error were eliminated the method still leaves a wide margin of wastage, for it is only after the breeding capacity of the bull has been demonstrated that its value for this purpose is known. An institution such as ours should be in a position to reduce the liability to error by studying all the factors that may be necessary to produce bulls which can be guaranteed to give milk-producing progeny. As a part of this problem it will be essential to find out whether it is possible to breed the dual purpose cow with certainty or whether one of the two capacities, beef or milk, will always tend to dominate the other to such an extent that effective breeding can only be carried out when one or other object is kept in view.

Here is one problem which lies before us if efficiency is to be attained. In the meantime the folly of destroying bulls before their value for breeding purposes has been demonstrated has been pointed out to us.

FEEDING PROBLEMS.

If, however, successful breeding of any sort is to be accomplished it cannot be separated from the mysteries of feeding, a very wonderful subject of which we have only recently begun to gather any real knowledge. Yet such knowledge as we possess tends to tell us that breeding capacity is more readily affected by unsuitable food than almost any other function of the animal economy and that it is not possible to measure the true value of a food stuff merely by knowing its chemical composition.

We have fed the simplest forms of life upon substances containing all the necessary chemical constituents. For a time they flourished, but after a time they died. The fact that they flourished for a time is very illuminating and has probably been one of the reasons why the necessity for knowledge of something more than the chemical composition of food stuffs has not been earlier appreciated. The continuance of an apparently healthy state for appreciable periods of time after the administration of inadequate food supplies has led us away from the true cause when trouble arose.

Golding, Drummond and Zilva have recently shown that the growing pig can flourish for a time upon a diet which is chemically complete, yet lacks that something which is found in fresh foods and which is so necessary for true health and growth. It is probable that during this period of continued growth the pig is using up the store of stimulent which is derived, perhaps from its mother, and when that is gone collapse follows. The mysterious failure of the baby, which looked so fat at six or twelve months of age, to progress as the years progress is being explained. Its food stuff was deficient in those stimulating substances which are present in fresh foods but tend to disappear as these are overtreated.

These are problems requiring much further investigation and are of extreme interest to the dairy industry. For on the one side it has been shown at Rothamsted that the persistent manuring of lands with artificial manures leads ultimately to a diminished crop which can only be restored by the use of farmyard manures. On the other, evidence is accumulating, that the milk of a grass-fed cow is richer in those stimulants to growth than that of a winter-fed cow. Such milk is, therefore, of greater value to the public. It is also of greater value to us, since with it we can rear a healthier calf, but this is not the end of the importance of this observation.

Though everybody knows that the use of artificial food stuffs adds greatly to the cost of milk, that is not to say that artificial foods should be eliminated from the dietary of cattle. It is, however, a reason why we should carefully investigate the food values of home-grown crops and artificial foods and consider what shall be the balance between them in a sound and economic system of feeding.

Such knowledge will involve a study of the chemical constituents and true feeding values of all types of food and of each constituent of such food before it is complete. It means long and laborious work, for the true value of a field of grass or other succulent crop can only be known when the value of each type of herbage in them has been investigated; not only as green food stuff, but also as hay or silage, or in any other form in which it may be used. Such work we hope to do at the National Institute for Research in Dairying.

It may be thought that the results of this work must lie in the far future. Of some of it that is true, but of some of it, the results are with us now since the extreme value of our grass land and the value of farmyard manure have been made manifest, and we are led to wonder to what extent we have been dependent upon these for our position in the world as breeders of cattle and to consider carefully before we rashly embark upon new systems for the sake of obvious immediate gain.

In the meantime much may be done to save waste by a careful consideration of the rations given to dairy herds. This is well brought out in Mackintosh's article, to which I have already referred, and in which he showed that it is often possible to reorganise the rations given to milking cows and save considerable sums of money without reducing the milk yield.

Have I spoken too much of these food problems? I trust not. They open up such fields of thought that it is not easy to let them go. Did Hopkins imagine, when he added a few drops of milk to the diet of rats and noted how much better they throve in consequence, of how great importance this observation would prove to the dairying industry? Yet it is by such methods as this, enlarged and developed to meet the special needs of our industry that we shall obtain the right bull, the right cow, and the right calf for our requirements. In so doing we shall save waste and bring credit upon the industry with which we are concerned.

WHOLE MILK AND LEGISLATION.

Let me, however, turn to other fields of work in which we are giving help. I have spoken of the whole milk industry and of the need of co-operation among those engaged in it. This industry is, to some extent, controlled by legislation, and we sometimes hear talk of more complete control. It is a point for us to remember that our whole milk industry is in need of improvement, that if we fail to effect such improvement, an attempt will almost certainly be made to force our hands, for the food stuff which we provide is too important to the nation to be allowed to remain in an unsatisfactory state. Such an attempt will not be satisfactory. This has already been proved in another great industry which failed to grasp its opportunities and has fallen into the clutches of legislative interference. There are, however, evidences that we are awakening to the great possibilities of our function and in the meantime every effort is being made at the National Institute for Research in Dairying to discover the truth concerning the real requirement for the proper keeping and carriage of milk so that a due restraint may be exercised over those who, in their enthusiasm and often in ignorance of the difficulties of the industry, would endeavour to demand impossibilities.

I have seen something of the inner working of these things during the past few years and I can assure you that violent proposals do not eminate from the Government departments concerned, neither do they come from scientific advisers who have some understanding of the real difficulties and are very unwilling to press for impossibilities.

In any movement for progress the first essential is to get at the facts, and for nearly five years now this work has been done by Kathleen Freear and Mattick.

It is the first occasion upon which such continuous work upon the condition of milk has been carried out in this country. Some of it has been published and some of it is about to be published. It shows what can be expected and what can not be expected of milk produced under certain conditions. Its effect upon wild legislation is of a very steadying character, but it needs to go on and it can only be continued satisfactorily if the industry will consider it seriously and give us the answers to one or two questions; one of the most important of which is the age at which milk shall reach the consumer. Surely it is a matter of the most vital importance to the industry that we are working on its behalf and are able to meet wild criticism with soundly established facts.

HELP FOR THE CHEESE MAKER.

Before I close this part of my lecture I would like to tell you the story of how the work of Golding, the late Miles Benson, Elfrieda Mattick and others saved a cheese factory from ruin.

Stilton cheese was being made at the factory and every year discolouration was so severe that a financial crisis was in sight. A prolonged investigation at the factory and in the laboratory demonstrated that the discolouration was caused by bacteria found in dirt. It further demonstrated that the discolouring effect was not produced in the presence of acid. For reasons into which I need not enter here it was not possible either to secure the complete elimination of dirt from the milk or to be certain that even if that were done a satisfactory Stilton cheese would be produced. It was, therefore, suggested that starter should be used in the making of the cheese and every year since that was done we have received satisfactory reports of the result.

This work gave rise to the investigation of other problems of importance, some of which are still being studied, but I will not discuss these here, merely pointing out that we can sometimes give immediate practical help and are always glad when that is so.

THE NEED FOR A STANDARD OF EDUCATION.

No one, I think, can have listened to all I have told you without realising that the milk and dairy industries have a developing future before them which will require a gradually improving standard of education.

At the present time the research workers and the teachers are banded together for progress. What is now needed is that those who are engaged in the actual work shall be gathered in.

As a first step I should like to suggest that those bodies which are concerned with the granting of diplomas, etc., for milk and dairy students shall initiate a common register of those holding qualifications of recognised value. As time went on this would lead to the elimination of the unfit, the general levelling up of the standard of work and increasing recognition of the dignity of our labour. It would also bring us into line with the members of other applied sciences to our own great advantage.

There appear to be two main lines of progress for consideration. On the one hand greater co-ordination of work within the milk trade, and, on the other, improvement in the standard of education.

Sunday; May 8th, 1921.